

Encoder 20mm Size Metal Shaft Type

EC20A/RK203 Series



Heavy torque and comfortable operation feel with compliance to encoder and potentiometer applications.

Detector

Push

Slide

Rotary

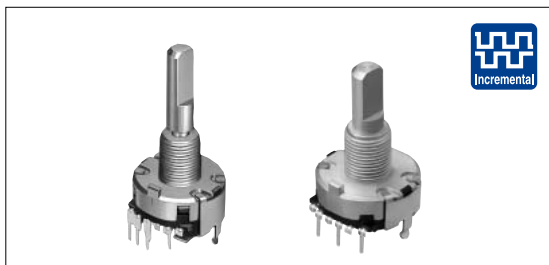
Encoders

Power

Dual-in-line
Package Type

TACT Switch™

Custom-
Products



Typical Specifications

Items	Specifications	
	Encoder	Potentiometer
Rating	1mA 5V DC	0.05W
Operating life	30,000cycles	

Product Line

Encoders

Operating section	Length of operating section (mm)	Detent torque (mN·m)	Number of detent	Number of pulse	Operating direction	Travel of push-on switch (mm)	Minimum order unit (pcs.)	Product No.	Drawing No.
Flat	30	40 ± 20	18	18	Vertical	1.5	400	EC20A1824401	1
						—		EC20A1820401	2

Potentiometer

Operating section	Length of operating section (mm)	Detent torque (mN·m)	Number of detent	Rotational angle	Operating direction	Minimum order unit (pcs.)	Product No.	Drawing No.
Flat	30	Shall be in accordance with individual specifications		240°max	Vertical	400	RK203110	3

Notes

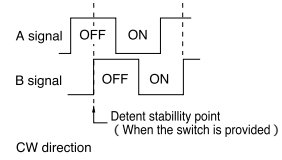
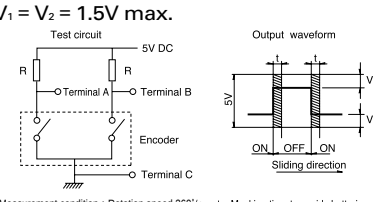
- For with switch type, only the incremental type is available.
- All the potentiometer types can be customized. Contact us with the detailed specifications if you have such requirements.

Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (View from mounting face)
1	EC20A with push-on switch (travel 1.5mm) Incremental Type 		
2	EC20A without switch type Incremental Type 		
3	RK203 without switch type Potentiometer Type 		

List of Varieties

Type		Metal shaft				Insulated shaft		
		11mm size			20mm size	12mm size		
Series		EC11G	EC11J	EC11K	EC20A/RK203	EC12E	EC12D	
						Standard detent Without detent	With push-on switch	
Photo								
Output		Incremental						
Outline specifications	Shaft types	Single-shaft						
	Operating direction	Vertical						
	Number of pulse/ Number of detent	15/30	9/18 15/30		18/18	12/12 24/24	15/30	
	Push switch (Travel mm)	Without With(1.5)	Without With(0.5, 1.5)		Without With(1.5)	Without	With(0.5)	
	Optional functions							
	Changeover angle							
Dimensions (mm)	W	11.7			2.0	12.4	12.5	
	D	12	14.2		19.2	13.2	11.7	
	H	4.5			10	5		
Soldering	Manual soldering	350 max. 3s max.						
	Dip soldering	260 ± 5 , 5 ± 1s		260 ± 5 , 5 ± 1s		260 ± 5 , 3 ± 1s		
	Reflow soldering		Please see P.189					
Operating temperature range		-30 to + 85	-40 to + 85		-30 to + 80	-10 to + 70	-40 to + 85	
Maximum operating current(Resistive load)		10mA			1mA	5mA	10mA	
Electrical performance	Output signal	Output of A and B signals, proportionate to phase difference						
	Output wave	Please see P.191						
	Sliding noise	Please see P.191				$V_1 = V_2 = 1.5V$ max.  Measurement condition : Rotation speed 360°/s t : Masking time to avoid chattering At R = 10kΩ Chattering : 3ms max. Bounce : 2ms max. At R = 5kΩ Chattering : 3ms max. Bounce : 2ms max.		
	Insulation resistance	100MΩ min. 250V DC			10MΩ min. 50V DC		100MΩ min. 250V DC	
	Voltage proof	300V AC for 1minute			50V AC for 1minute		300V AC for 1minute or 360V AC for 1s.	
Mechanical performance	Rotational torque	$7 \pm \frac{3}{4}$ mN·m				10mN·m max. 25 ± 15mN·m 40 ± 15mN·m		
	Detent torque	10 ± 7mN·m		12 ± 5mN·m		40 ± 20mN·m	$3 \pm 2mN \cdot m$ 3 to 20mN·m	
	Push-pull strength	100N				80N		100N
Environmental performance	Cold	-40 ± 3 for 240h				-40 ± 3 for 240h ± 10h		
	Dry heat	85 ± 3 for 240h				85 ± 3 for 240h ± 10h		
	Damp heat	60 ± 2 , 90 to 95% RH for 240h				60 ± 2 , 90 to 95%RH for 240h ± 10h		
Push-on Switch Specifications	Circuit · number of contacts	Single pole and single throw (Push-on)						Single pole and single throw (Push-on)
	Travel (mm)	0.5 ± 0.3	1.5 ± 0.5	0.5 ± 0.3	1.5 ± 0.5	0.5 ± 0.3	1.5 ± 0.5	
	Operating force(N)	$6 \pm \frac{2.5}{2}$	4 ± 2	5 ± 2	4 ± 2	5 ± 2	4 ± 2	
	Rating	0.5A 16V DC (1mA 16V DC min. ratings)		0.1A 5V DC		0.5A 16V DC (1mA 16V DC min. ratings)		
	Contact esistance	100mΩ for initial period; 200mΩ after operating life						
	Operating life	20,000times min.		1,000,000 times min.	500,000 times min.	1,000,000 times min.	100,000 times min.	20,000times min.
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Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

TACT Switch™

Custom-
ProductsIncremental
TypeAbsolute
Type

Product Specifications

Output Wave

EC11B	EC11E/EC11G/EC11J/EC11K	EC111/EC11E													
EC11B, EC11E, EC11G 30 detents, 15 pulse Detent stability point CW direction	The stable detent position cannot be identified in phase B. EC11E 18 detents 9 pulse EC11E 36 detents 18 pulse EC11J, EC11K Detent stability point CW direction														
EC11EH	EC20A														
Detent position CW direction	<table border="1"> <thead> <tr> <th>Shaft rotational Direction</th><th>Signal</th><th>Output</th></tr> </thead> <tbody> <tr> <td rowspan="2">Clockwise</td><td>A(Terminal A-C)</td><td>OFF ON</td></tr> <tr> <td>B(Terminal B-C)</td><td>OFF ON</td></tr> <tr> <td rowspan="2">Counter-clockwise</td><td>A(Terminal A-C)</td><td>OFF ON</td></tr> <tr> <td>B(Terminal B-C)</td><td>OFF ON</td></tr> </tbody> </table> The dotted lines indicate detent positions		Shaft rotational Direction	Signal	Output	Clockwise	A(Terminal A-C)	OFF ON	B(Terminal B-C)	OFF ON	Counter-clockwise	A(Terminal A-C)	OFF ON	B(Terminal B-C)	OFF ON
Shaft rotational Direction	Signal	Output													
Clockwise	A(Terminal A-C)	OFF ON													
	B(Terminal B-C)	OFF ON													
Counter-clockwise	A(Terminal A-C)	OFF ON													
	B(Terminal B-C)	OFF ON													

Detector

Push

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Rotary

Encoders

Power

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Package Type

TACT Switch™

Custom-
Products

Sliding Noise

EC11B	EC11E/EC11G/EC11J/EC11K	EC111/EC11E
$V_1 = V_2 = 1.5V \text{ max.}$ Measurement condition : Rotation speed 360°/s t : Masking time to avoid chattering At R = 5kΩ Chattering : 2ms max. Bounce : 2ms max.	At R = 5kΩ Chattering : 3ms max. Bounce : 2ms max.	
EC11EH	EC20A	
Test circuit Test condition : Rotation speed 360°/s At R = 5kΩ Chattering : 5ms max. Bounce : 5ms max.	$V_1 = V_2 = 1.5V \text{ max.}$ Measurement condition : Rotation speed 360°/s t : Masking time to avoid chattering At R = 5kΩ Chattering : 8ms max. Bounce : 5ms max.	

Incremental
TypeAbsolute
Type

Attached Parts

EC11B Series

Unit:mm

Hexagonal nut	Flat washer